TECHNIQUES FOR ESTIMATING COUNTY INCOME IN A SIX-STATE AREA

METHODOLOGICAL SUMMARY REPORT
1 June 1966

Contract No. NASr-63(04)
MRI Project No. 2571-M

For

Headquarters
National Aeronautics and Space Administration
Office of Grants and Research Contracts
Washington, D. C. 20546

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Personal income is considered to be one of the best single measures of economic progress and well-being. This is true at all levels--national, state, and local. Estimates of personal income for the nation are published monthly by the U. S. Department of Commerce, Office of Business Economics, in its Survey of Current Business, and state estimates are prepared annually. Unfortunately, comparable estimates of personal income at the county level are not available. Because of the need for income information at the sub-state level, a research effort was undertaken, under the sponsorship of the National Aeronautics and Space Administration, to stimulate development of estimates of county income, population and other measures of economic progress for a six-state region.* Questions relating to concepts, methodology, data sources, and data limitations for the region as a whole are discussed in a series of separate volumes.** This report, one of the series, presents a description of the methodology used by the six-state study teams to estimate county personal income for the years 1950-1962.

The principal investigators, who had the responsibility for conducting the research in their state (Oklahoma) and of coordinating the efforts of the other state participants, were Dr. W. Nelson Peach, University of Oklahoma;

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*   Arkansas, Iowa, Kansas, Missouri, Nebraska, and Oklahoma.

**   Richard W. Poole, James D. Tarver, David White and William R. Gurley, An Evaluation of Alternative Techniques for Estimating County Population in A Six-State Area, Economic Research Series No. 3, Oklahoma State University, 1966.

W. Nelson Peach, Richard W. Poole and James D. Tarver, County Building Block Data for Regional Analysis: Oklahoma, Research Foundation, Oklahoma State University, March 1965.

W. Nelson Peach, Richard W. Poole, James D. Tarver, Larkin B. Warner and Lee B. Zink, Source Notes and Explanations for County Building Block Data for Regional Analysis, Research Foundation, Oklahoma State University, March 1965.

Larkin Warner, Estimates of Electricity Sales by Utilities, by County and Class of Service, Oklahoma, 1950 and 1960, Research Foundation, Oklahoma State University, 1965.

Dr. Richard W. Poole, Oklahoma State University; and Dr. James D. Tarver, Oklahoma State University. The state project directors in the other five states were Dr. Robert N. McMichael, University of Arkansas; Dr. Lewis E. Wagner, State University of Iowa; Dr. Darwin W. Daicoff, University of Kansas; Dr. Robert W. Paterson, University of Missouri; and Dr. Wallace C. Peterson, University of Nebraska.*

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* Dr. Glenn H. Miller, Jr. initiated the work in Kansas prior to moving to Boston to complete requirements for the Ph.D. Dr. Vincent E. Cangelosi directed the work in Arkansas prior to leaving for a year's postdoctoral study under a National Science Foundation Grant. Mr. Conrad Stucky directed the work in Iowa before accepting a Ford Foundation assignment in Lebanon.

TABLE OF CONTENTS

SUMMARY

The basic aim of this study is to develop uniform economic indicators which can be used to help assess and measure the economic impact of NASA programs. Meaningful analysis requires a strong foundation of basic data, and it is apparent that one of the principal obstacles to effective regional analysis is the lack of good, comprehensive data on small areas. Among the most critical needs are basic county building-block data, particularly annual estimates of population and personal income. A major objective of this study is to help satisfy this need in a six-state midwestern region.

As a result of this project, several of the participating states have established programs to generate estimates of county income on a continuing basis. Efforts are being made to continue the program in Oklahoma, and the Bureau of Business and Economic Research at the University of Nebraska is currently refining and updating its estimates of Nebraska county income. The same is true for the University of Arkansas, which has had a similar program for some time. The Office of Economic Analysis of the State of Kansas has computerized its program to allow annual updating of its county income estimates. Programs are also currently under way, at the State University of Iowa, Bureau of Business and Economic Research, and the University of Missouri Research Center to refine and update the estimates for those states. To be most useful, however, similar programs must be developed and maintained in all states throughout the nation.

Reasonable uniformity in approach of estimating and reporting county income was achieved, but improvements can and should be made in future efforts. Improvements and greater standardization of basic source data would offer the greatest benefit. Efforts in this direction were begun during the course of this study through meetings with state officials of the various data-generating agencies.

One of the most significant steps which can be made would be to develop uniform coverage, collection, and reporting procedures for employment security data. Among many other applications, these data are used extensively in estimating county income, and lack of uniformity seriously limits the reliability of interstate comparison of the resulting county income estimates. Because of federal involvement in the employment security program, this problem would appear to be one which would be relatively simple to resolve.

Probably the greatest single shortcoming of the county income estimates for the six states stems from the fact that no situs adjustments were

made.* Failure to adjust for commuting across county lines results in estimates which can be misleading. This failure to adjust for situs is a problem not only at the county level, but at the state level as well, since the Office of Business Economics (OBE) makes such adjustments only for a few selected states, none of which fall within the six-state region. More work needs to be done at all levels in this critical problem area.

This study and similar multi-state research programs are helpful and represent a step in the right direction. But, until a permanent continuing program with methodological guidance and coordination at the federal level is established, progress toward achieving continuity, consistency, and comparability will be limited. On the other hand, the magnitude of the problem is so great that local participation at the state level is a must.

To fulfill this need MRI recommends that a program be established at the federal level to coordinate and guide development of annual estimates of county population and income. The role of the federal government in this program would be to provide technical assistance and to monitor work carried on at the state level. Working relationships would be established with an agency in each state, presumably the state university or an appropriate agency of the state government, which would carry out the actual work of preparing the estimates. Financial support on some kind of matching basis would probably be most effective in eliciting state support and cooperation.

A second critical need is greater standardization among the states in the development and reporting of statistical information. State administrators are becoming aware of the need for standardization and are beginning to grope for a solution, as is evidenced by the recent effort of the National Governors' Conference to develop suitable mechanisms for achieving standardization among the states.** Every encouragement should be given to this effort and others designed to foster greater uniformity in regional data collection and reporting.

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*/ Situs adjustments are adjustments made to account for commuting across county or state boundaries. Adjusted estimates are available for the state of Kansas.

**/ Dr. Richard W. Poole, one of the principal investigators on this study, played a major role in bringing this problem to the attention of the Governors' Conference. See "Statistical Standardization Among the States: A Tool for Decision Making," (Proceedings of the 1965 National Governors' Conference), Business Papers, College of Business Extension Service, Oklahoma State University, Stillwater, January 1966.

I. INTRODUCTION

The regional distribution of federal expenditures has always been a matter of considerable interest. Each region is concerned that it gets its "fair share," and announcements of contract awards are watched closely by local officials who protest loudly when contracts are granted to firms outside their area. The view is widely held that a major contract, a new installation, or some other infusion of federal funds is the stimulus needed to start the town, the state, or the region on the way to achieving economic prosperity and growth. By the same token, the loss of a government contract or installation drops the community to the depths of despair.

NASA, with contract awards amounting to $4.6 billion in fiscal 1964,[1] is concerned about the impact of its expenditures and programs. To evaluate alternative programs and proposals properly, NASA decision makers need to have good insight into the impact of their decisions on the affected regions. They need to know, for example, what will be the effect on a multi-county region of a new NASA program which requires increased levels of production and generates increased employment over a relatively short two- or three-year period. What is the long-run effect of this temporary stimulus on the community's economy? Or conversely, what will be the regional impact of a cutback in NASA expenditures?

Any effort to assess the impact of federal activity, in this instance NASA activity, on the economy of the region must, by definition, consider two basic elements. One is related to the federal activity itself. Quantitative measures such as federal civilian and military employment, or federal expenditures, or other measures must be developed in order to measure the extent of federal activity. These indicators can then be related to the other basic element of impact analysis--the regional economy, and its various performance indices.

Initial effort in this program focused on the "regional economy" side of the problem. This required a time-consuming task of identifying and developing the basic data to serve as indicators of regional economic growth and activity. Another consideration was that, at the time the study was initiated, NASA was only beginning to develop data on contract and subcontract awards.

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[1] National Aeronautics and Space Administration, NASA Annual Procurement Report, Fiscal Year 1964, Washington, D. C., p. 3-2.

The principal investigators were presented with several alternative ways of examining the regional economy. They could consider the multi-state region as a whole; they could focus on the state level; or they could examine regions at the sub-state level. The geographic extent of a region will vary with the problem under study, and often extends across state boundaries for many purposes of analysis. A river basin study, a mineral resource area study, a labor market area study for an aerospace installation, etc., all demand different area delineations. Therefore, the decision was made to concentrate efforts on developing information at the sub-state level, specifically the county level.

Again, several alternatives were open to the principal investigators. They could select specific communities or sub-regions for analysis as individual case studies. They could concentrate on the major economic centers in the region--the urban areas of Standard Metropolitan Statistical Areas (SMSA's). Or, they could examine the entire region, covering both urban and rural sub-regions. Each approach has certain advantages and limitations. After weighing the merits and limitations of each approach, the principal investigators decided to follow the latter approach--complete coverage of the entire region on a county-by-county basis.

A series of meetings and conferences with representatives of federal, state, and local government agencies, university researchers, and others interested in regional analysis were held for the purpose of identifying those measures which might best reflect economic progress in the region. Among the basic measures selected were population and personal income.

Population and personal income are two types of basic information essential for regional analysis. Unfortunately, annual estimates of such critically needed building-block data are not available on a county-by-county basis. This data limitation, as well as the absence of more advanced research on problems of regional and sub-regional underdevelopment and economic imbalance, accounts for the present inability to effectively evaluate the impact of regional development programs. Thus, an essential first task for this project was to develop and utilize a reasonably uniform methodology to generate pertinent economic data on a county-by-county basis.

At the outset of the project, every effort was made to involve competent researchers from the six-state Midwestern area, to obtain the benefit of their knowledge of the availability and peculiarities of state and local data of their respective states. These local researchers also were familiar with their states, and were in the best position to evaluate and interpret the research findings. But one of the most important reasons for including participants from each state was to encourage a continuation of the program at the state level on a permanent basis.

The development of the basic economic progress data required the major effort in this research program. It resulted in a series of reports on various aspects of the problem, of which this report on county income is one.

The basic measures of economic progress having been developed, the remaining task becomes one of relating information regarding NASA activity to the local economy in order to evaluate the impact of that federal activity. The outcome of this impact analysis will be the subject of a subsequent report.

II. PROBLEMS OF REGIONAL ANALYSIS

A. The Nature of Regions

It has become an accepted premise among those concerned with regional analysis that regions must be defined on a functional basis. No single regional delineation is suitable for all purposes.[2] The river basin planner is concerned with a region defined in terms of hydrologic or watershed boundaries.

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[2] For a sample of the literature dealing with the regional concept, see: Donald J. Bogue, State Economic Areas, U. S. Department of Commerce, Bureau of the Census (Washington, D. C., 1951) pp. 1-6; Joseph L. Fisher, "Concepts in Regional Economic Development," Papers and Proceedings of the Regional Science Association, I (1955), pp., W-1 thru W-20; Walter Isard, "Regional Science, The Concept of Region, and Regional Structure," Papers and Proceedings of the Regional Science Association, II (1956), pp. 13-26; Walter Isard, et al., Methods of Regional Analysis: An Introduction to Regional Science, New York: John Wiley & Sons, Inc. (1960), pp. 322-324; Harvey S. Perloff, "Problems of Assessing Regional Economic Progress," Regional Income, Studies in Income and Wealth, XXI, National Bureau of Economic Research (Princeton: Princeton University Press, 1957), pp. 37-62; Harvey S. Perloff, Edgar S. Dunn, Jr., Eric E. Lampard, and Richard F. Muth, Regions, Resources, and Economic Growth, Resources for the Future, Inc. (Baltimore: Johns Hopkins Press, 1960), pp. 4-8; Charles M. Tiebout, "A Method of Determining Incomes and Their Variations in Small Regions," Papers and Proceedings of the Regional Science Association, I (1955), pp. F1-F12; Morris B. Ullman and Robert C. Klove, "The Geographic Area in Regional Economic Research," Regional Income, Studies in Income and Wealth, XXI, National Bureau of Economic Research (Princeton: Princeton University Press, 1957), pp. 87-109; Rutledge Vining, "The Region as an Economic Entity and Certain Variations to be Observed in the Study of Systems of Regions," Papers and Proceedings of the American Economic Association, XXXIX (May, 1949), pp. 90-92.

These boundaries, in all likelihood, will differ from those used in analyzing labor markets, mineral resources, or the region affected by a new NASA installation. Nor will these boundaries conform to state lines or other political jurisdictions. Thus, the geographic shape of a region is dictated by the nature of the problem under study. Consequently, it is imperative that the region be defined in terms which enable the decision maker to efficiently analyze the important problem variables.

B. Availability of Data

During recent decades considerable progress has been made in improving economic and social data at the national and state levels. This improvement has made possible a corresponding improvement in the decision-making process by a wide variety of public and private agencies. Unfortunately, this program has not been paralleled by a comparable improvement in data for the areas smaller than the state. It has become well recognized that the greatest obstacle to regional analysis is the lack of comparable, reliable, comprehensive data on political or geographic units smaller than the state.

In a report dealing with needed improvements in federal statistics, released recently by the Joint Economic Committee,[3] there are repeated references to the need for more and better county data. For example, Mr. William Butler, Vice President, the Chase Manhattan Bank, states:

> "As for regional statistics, the Federal Government could not possibly fill all of the demands." . . . .

> "First priority items in terms of better local statistics should go to measures of total output or income . . . . . . The Federal Government, which now provides annual data on personal income by States, could provide the statistical framework to enable regions to estimate personal income from the State aggregates. Some States (New York) already do this, but there should be a model to insure comparability between areas."[4]

3/   Joint Economic Committee, Improved Statistics for Economic Growth, A
      Compendium of Views and Suggestions from Individuals, Organizations,
      and Statistical Users, July, 1965.
4/   Ibid., page 19.

Mr. Julius Barnathan, Vice President, American Broadcasting Company, reports:

> "Our analyses require small-area data. County-by-county sta-
> tistics are most useful in that such data can be combined to
> represent the area a particular station serves."5/

Mr. David L. Ferguson, Director of Marketing Research, Investors Diversified
Services Incorporated, stresses the value of timeliness:

> "Rather than comment in great detail on one part of or
> another of the program, I would like to make a rather strong
> plea. That plea is to develop demographic information on a
> geographic basis more frequently than once every decade.
> Rapid changes are taking place in this country in terms of
> population shifts and business and industrial development.
> These are taking place at such a pace that the information
> collected one year is frequently out of date the next, to
> say nothing of 10 years later."6/

Mr. A. J. Jaffe, Director of Manpower and Population Program, Bureau of Applied
Social Service Research, Columbia University, reports:

> "All manner of information is needed for small areas, i.e.,
> counties and cities, especially for the years between de-
> cennial population censuses. At present it is impossible
> to obtain reliable statistics about economic and social
> conditions in these areas."7/

Mr. Herbert Stein, Director of Research, Committee for Economic Development,
states:

> ". . . For designating areas eligible for assistance under
> the Area Redevelopment Act, one of the critera is low in-
> come. But the Area Redevelopment Administration has to rely
> on income figures from the population census of 1960 to
> designate such areas. Economic conditions have changed so

5/ Ibid., page 6.
6/ Ibid., page 39.
7/ Ibid., page 78.

much since 1960 that some of the counties eligible for assis-
tance under the criterion undoubtedly should not now be. Other
areas, however, may have suffered sufficient economic setbacks
so that they should be eligible for assistance. More frequent
data on income for counties, therefore, would certainly be
helpful in carrying out the area redevelopment program. It
would also assist many business firms in selecting locations
for facilities and in their marketing programs."8/

Even where data for smaller units have been improved in a particular
state, the regional analyst faces severe problems when he moves across the
state lines. Examples of factors which lead to discrepancies and discontinu-
ities in interstate comparison of data generated by separate states are numer-
ous. Some states make annual county population estimates, e.g., Kansas con-
ducts an annual census. Annual county income estimates are available for a few
states. But more often than not, the methods used vary widely from state to
state. Each of the 50 states has its own body of tax and spending laws. Some
states have income taxes; others do not. Even in the case of two states hav-
ing taxes on income and sales, the taxes will vary with respect to such factors
as rates and coverage. The situation is further complicated by wide differ-
ences in the administrative machinery for handling statistical data among the
various states. And, there are big differences in the interest shown in sta-
tistical data by agencies within a particular state and among the states.

Because of these data limitations and inconsistencies, one of the
basic tasks of this study was to develop, for the six-state area, a series of
basic data essential for regional analysis.

C. The Building-Block Concept

The county has become the basic unit or building block for use in
regional analysis. The county is small enough to serve as a building block
for multi-county regions yet large enough to qualify as a workable statistical
unit. Moreover, there are more pertinent time series data available for the
county than for any other local unit. Given comparable data on a county basis,
any user can put together as many counties as may be required for the problem
at hand. And, since dramatic or sudden changes in county boundaries are not
expected, disruption of the continuity or historical validity of the county
building-block data is not a problem.

8/ Ibid., page 132.

For certain purposes, however, the county presents limitations as a statistical unit. This is true especially for counties in and near metropolitan areas, where large numbers of workers commute from one county to another. For example, a large aerospace installation in Oklahoma City is the largest employer of civilian labor in an adjoining county. Further, this installation, located in Oklahoma County, draws its employees from 24 different counties.[9]

Additional complications arise when workers in a border county in one state commute to work in a county across the state line. Data on the volume of such commuting are available for only one year, 1960. In that year, in the case of Sequoyah County in eastern Oklahoma, almost one-third of the entire labor force worked across the state line. Wage and salary income is usually reported on the basis of job location; consequently, if no statistical adjustment is made, a serious understatement of this income component would result for residents of Sequoyah County. Thus, when per capita income is computed for Sequoyah County, an adjustment, referred to as a situs adjustment, must be made to take into account this large volume of commuting.

Despite these disadvantages of the county as a statistical unit, it is still the best available. Fortunately, when data on a group of counties surrounding a metropolitan area are combined into one larger multi-county group, the problem of _situs_ tends to be reduced.

D. Economic Progress Data for the Six-State Region

The types of data needed to facilitate regional analysis and decision making were determined in consultation with other regional investigators within and without the six-state area; private, civic, planning, and development groups; business firms; and appropriate federal, state, and local government agencies. Through a series of conferences, data priorities were established.

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[9] For more information on commuting among counties in Oklahoma see:
Richard W. Poole, "Implications of Labor Characteristics and Commuting Patterns for Regional Analysis," Land Economics, XL (February, 1964); Richard W. Poole, and Leonard F. Drinko, "The Clinton-Sherman Air Force Base Civilian Labor Force," Oklahoma Labor Market, Oklahoma Employment Security Commission, Oklahoma City (September, 1963); Walter A. Smith, "The Vance Air Force Base Labor Force, "Oklahoma Labor Market, Oklahoma Employment Security Commission, Oklahoma City (August, 1963); Richard W. Poole, Characteristics and Commuting Patterns of the Oklahoma City Air Material Area Labor Force (United States Air Force, Oklahoma City, 1962).

The resulting framework and system of data collection for the six-state pilot program could be logically subclassified under two broad categories: "principal measures of economic progress," and "supporting measures of economic progress."

Principal measures of economic progress: This category includes measures previously not available on a reasonably uniform basis for all 564 counties. These principal measures are personal income and population. The development of these data required the greatest inputs of manpower, and they also presented the major methodological problems.

To initiate the population work, a regional workshop on county population estimates was held at Midwest Research Institute in Kansas City, Missouri, in July 1962. A major objective of the two-day conference was to clarify procedures for reporting county school enrollment. Other sources of data and methodology were discussed. Participants included the director of school statistics and the director of vital statistics in each of the six states; persons active in making population estimates in the area; a representative of the Population Division, U. S. Bureau of the Census, Washington, D. C.; and a representative of the Office of Health, Education and Welfare from Washington, D. C.

In turn, to initiate the personal income work, a three-day conference on sources and methods of estimating personal income by county was held at the Midwest Research Institute during the fall of 1962. Project Directors of the county income estimating program were present from each of the six states. Federal statistical agencies sending representatives from Washington included the U. S. Department of Agriculture, the Social Security Administration, the National Income Division of the U. S. Department of Commerce, and the Bureau of the Census. The conference was attended also by representatives of the state Departments of Agriculture in the six-state area, State Employment Security Offices, representatives of the various state Public Welfare Commissions, and the Tax Commissions.

Supporting economic progress data: The supporting economic progress data are useful in the analysis of the trends revealed by the principal measures of economic progress. They include information on such aspects of each county's economy as agriculture, mining, wholesale trade, retail trade, manufacturing and banking. Also, data are presented for selected years on social characteristics such as education, housing, race and age distribution of the

population. A separate report[10] illustrating the types of economic progress data assembled has been prepared along with a description of source notes and explanations.[11]

III. PERSONAL INCOME AS A MEASURE OF ECONOMIC GROWTH

Personal income is generally considered to be the best single measure of economic well-being at the national, state, and county level. The Office of Business Economics of the U. S. Department of Commerce publishes, in its Survey of Current Business, monthly estimates of personal income for the nation. Estimates of personal income by states are made annually, with the series available since 1929.

The Regional Economics Division of OBE, established in 1964, is in the process of preparing seasonally adjusted estimates of state personal income on a quarterly basis. It is also developing estimates of personal income received by residents of Standard Metropolitan Statistical Areas, where about three-fourths of the income of the nation is received. To date, however, most of the county income work has been carried on by university or other private groups--and typically on a sporadic basis.

A. Definition

Personal income is defined by the Department of Commerce as:

". . . the current income received by persons from all sources, inclusive of transfers from government and business but exclusive of transfers among individuals. Personal income is measured on a before-tax basis, as the sum of wage and salary disbursements, other labor income, proprietors and rental income, interest and dividends, and transfer payments, minus personal contributions for social insurance."[12]

10/ Peach, W. R. Nelson, Richard W. Poole, and James D. Tarver, County Building Block Data for Regional Analysis: Oklahoma Research Foundation, Oklahoma State University, Stillwater, March, 1965.

11/ Peach, W. R. Nelson, et. al., Source Notes and Explanations to County Building Block Data for Regional Analysis, Research Foundation, Oklahoma State University, Stillwater, March, 1965.

12/ U. S. Department of Commerce, Office of Business Economics, National Income, 1954: A Supplement to the Survey of Current Business, Washington, 1954, page 58.

B. The Situs Problem

Personal income represents income received by persons according to place of residence, as opposed to "income payments," which records income (geographically) on a "where earned" basis. Thus, the estimates of personal income for the state of Connecticut include income earned in New York City by residents of Fairfield County, Connecticut. Similarly, personal income for the state of New Jersey includes income of Bergen County, New Jersey, residents earned in New York City. The same concept applies, of course, at the county level within any given state.

This geographic designation of income on a "place of residence" basis introduces one of the most critical and perplexing problems associated with county income analysis--the situs or commuting problem. Many of the measures used to distribute state totals to the counties are constructed using data available only on a place of employment basis. Use of these allocators can lead to an improper distribution of income where extensive commuting across county or state lines is prevalent. Ideally (and for some areas it is essential) adjustments should be made to correct for the situs problem.

The 1960 Census of Population includes information on commuting patterns. These data should be most useful in making situs adjustments in the future. However, because extensive changes in commuting patterns occurred during the study period (1950-62), it was decided not to attempt uniform adjustments based on the single observation. The other alternative is to treat each problem separately, developing unique procedures on the basis of the situation in each case. In some cases, such as in Oklahoma County, Oklahoma, special studies of commuting patterns have been made. For some major urban centers, recent origin and destination studies provide valuable insights into the problem. In the majority of instances, however, little information is available on which to base situs adjustments, and special surveys or studies are required.

Fortunately, for many purposes of regional analysis, data for individual counties are combined into a multi-county region, such as an SMSA or larger area. Then, what were once inter-county movements became intra-regional movements, and the situs problem is minimized.

Recognizing the problem, and also recognizing the time and budget constraints imposed on the individual state participants, the principal investigators, with concurrence of the state project directors, decided not to make situs adjustments. They concluded that individual researchers, given the basic income data, are more familiar with the specific areas, and are better qualified to make the necessary adjustments.

IV. ALTERNATIVE PROCEDURES FOR ESTIMATING COUNTY INCOME

The task of estimating personal income by county is not a simple one. There are no good direct measures of personal income at the county level. Therefore, most personal income data series are constructed using indirect allocations, and the reliability of many of these indirect measures is open to serious question. In fact, some researchers, pointing to the deficiencies of the data underlying the estimates, as well as the situs problem, seriously question the desirability of preparing estimates of personal income by county. They contend that the results are unreliable and often misleading because of the unreliability of the allocator data.

Others are convinced, however, that personal income data by county are sufficiently reliable to be of aid in decision making. They argue that if the user is aware of the shortcomings of the data and interprets them accordingly, he will find the county income estimates most useful in evaluating sources of income and the patterns of change. The principal investigators report that data for the heavily populated counties, particularly when aggregated into SMSA or other functional economic areas, have a high degree of reliability. These heavily populated areas account for an increasing share of the total population and total income of the state. On the other hand, they warn that the estimates for some of the sparsely settled counties are subject to wide margin of error. But these should improve over time as the basic data sources and estimating procedures are refined. Despite the limitations, estimates of county income will see increased application in regional analysis, and in the public policy making process.

One of the approaches which has been used to estimate county income involves the use of regression or other techniques which relate income to one or more variables, such as bank debits, sales tax receipts, etc. Although relatively simple and straightforward, this method has the disadvantage of providing only limited detail on the individual components of income. Moreover, regression analysis is only a statistical technique, which leaves open to serious question the functional relationship between any single indicator and total income.

A second method is to build up total county estimates, using a number of different types of county data such as income tax returns, wage data applicable to particular industries, financial statistics, and other information directly related to income and available at the county level. One of the major limitations to this method is the questionable quality and lack of comparability of many of the county data. Wide differences in the coverage and reliability of data generated at the county level tend to limit the usefulness of this estimating technique.

The method for estimating personal income by county which has been used most commonly in recent years involves the distribution of state income figures among the different counties by various allocation techniques. The state totals developed and broken down into major income categories by OBE are wages and salaries, property income, proprietors' income, other labor income, and transfer payments. Each of these categories is further subdivided into various subcomponents. Using allocation techniques, each category or sub-component of state income is distributed to the counties.

The allocation technique, at least in concept, is very simple. It involves distributing total state income to the counties on the basis of the same percentage distribution of some other related series of county data. For example, using this technique, total state personal income from interest could be allocated to the counties on the basis of the county distribution of bank deposits. Or, total wages and salaries from manufacturing might be distributed on the basis of the county distribution of wages in manufacturing as reported by the State Department of Employment Security. Obviously, estimates derived in this fashion are only as good as the data series used for the allocation.

On the other hand, some of these problems would be alleviated with access to federal income tax returns. Use of these data would make it possible to obtain both local and national totals from one source which includes all types of income. Another major advantage of using tax data would be the elimination of the situs problem, since tax returns are filed on the basis of place of residence. To date, the massive amount of paperwork involved in working with tax returns has been a major limitation. There are also problems relating to disclosure regulations. But, modern data processing equipment and information-retrieval techniques could eliminate these obstacles in the future.

The procedures selected by the principal investigators and the state project directors to estimate county personal income for the six states are outlined in the following section. In some instances the methodology was quite complex, and because of limitations in the data, major adjustments were required. It is not the purpose of this report to discuss the procedures followed by each state in detail. The detailed methodology is presented in a separate statistical appendix for each state. The purpose here is to indicate the general approach followed and the principal deviations and/or modifications.

V. ESTIMATING PROCEDURES USED BY THE SIX STATES

This section of the report presents summary descriptions of the various methodologies used by the six states to allocate the components of

personal income. Each major income component is defined, alternative allocators are discussed, and then deviations and/or modifications by individual states are summarized.

A. Wage and Salary Income

1. Definition

Wage and salary disbursements include that portion of personal income which accrues to individuals in return for their services on behalf of all business organizations, educational institutions, governmental units, etc. The Office of Business Economics provides annual state wage and salary information for the following employment sectors:

    a. Farms
    b. Mining

        (1) bituminous and other soft coal
        (2) crude petroleum and natural gas
        (3) mining and quarrying, except fuel

    c. Contract construction
    d. Manufacturing
    e. Wholesale and retail trade
    f. Finance, Insurance and Real Estate

        (1) banking and other finance
        (2) insurance and real estate

    g. Transportation

        (1) railroads
        (2) highway freight and transportation and warehousing
        (3) other transportation

    h. Communications and public utilities

        (1) telephone, telegraph, and other communications
        (2) electric, gas, and other public utilities

i. Services

    (1) hotels and other lodging places
    (2) personal services and private households
    (3) business and repair services
    (4) amusement and recreation
    (5) professional, social, and related services

j. Government

    (1) federal, civilian
    (2) federal, military
    (3) state and local

k. Other Industries

Estimates of these categories and subcategories were provided by the Office of Business Economics for each year from 1950 through 1962 for each state.

The allocation of the wages and salaries component of personal income is of central importance to any study which attempts to allocate income to the county level. Although the percentage varies from year to year and from state to state, wages and salaries typically account for about two-thirds of total personal income. Although this relationship will vary in accordance with the particular phase of the business cycle, the wage and salary share is of this general magnitude throughout the period covered by this study.

2. Alternative Allocators

The allocation of wages and salaries is best handled by treating separately each wage and salary subcategory. Two basic sources of information are used to distribute wages and salaries. The source used most frequently is the data furnished by the Employment Security Divison of each state. These agencies generate comprehensive wage and employment data. The second basic source is the Bureau of the Census, which periodically provides county data in its censuses of population, agriculture, government, mineral industries, business (retailing, wholesaling, selected services) and manufacturing. A number of other sources of specialized data, generated both at the Federal level and at the state level, are used in allocating specific subcategories of wages and salaries. For example, the Department of Defense provides data on employment and payrolls for specific military installations which are used in the allocation of military wages and salaries. School district budgets and state publications which record state, county, and municipal finances are used in allocating state and local government wages and salaries. A more detailed discussion of specific measures and their strengths and limitations follows.

Employment Security Division data: Employment Security Division data are widely used in the allocation of wages and salaries because these data have several distinct advantages. One major advantage is that, in most cases, wage and salary and/or employment information on each county is available on an annual basis. And, employment security data usually cover the most important employment sectors within each state economy. Another consideration which favors its usage is that much of the work OBE does in estimating state totals for the wage and salary category is based on state Employment Security Division data.

This source of data does have limitations, however. Coverage and manner of reporting vary widely from state to state. Consequently, direct comparisons at the county level on a state-to-state basis are not necessarily reliable.

One problem is variation in industry detail and definition. For example, the Kansas Employment Security Division prior to 1958 classified industry on the basis of the Social Security Board Industrial Classification code. Since 1958, the Standard Industrial Classification has been used. A different, but related, problem exists in Oklahoma, where the extent of county detail provided by the Oklahoma Division of Employment Security varies from industry to industry. In recent years, only data for the larger Oklahoma counties are available (46 out of a total of 77 counties). This means that other measures must be used to supplement the state employment security data.

Another problem is introduced by differences in coverage among the states and by changes in coverage over time. In Arkansas, for example, employers in covered industries report wage payments if they have one or more employees; in other states the coverage is not so complete. In most states prior to 1956, firms with eight or more employees were covered by employment security. In 1956, coverage was expanded to include firms with four or more employees.

Many firms carry on operations in more than one county. The wages and salaries paid by these firms are often credited to the county in which the headquarters is located. Also, a part of wages and salaries is classified as multi-county and not assigned to specific counties. Therefore, it is necessary to apportion this undistributed wages and salaries to the various counties. Different methods can be employed. In Kansas, for example, a survey of employers is made every two years to determine the county location of employees for each multi-county employer. In this instance, the average of the odd-numbered years was used to approximate county employment for the even-numbered years. A different approach was used in Missouri, where part of the employment of multi-county firms was allocated to the SMSA counties and the

remainder to the other counties on the basis of the distribution of covered employment. Oklahoma, employing yet a different approach, allocated the multi-county wages and salaries for each industry on the basis of the distribution of total covered wages and salaries in that industry reported by county.

Another problem relates to differences in reporting. The situation in Oklahoma, where wages and salaries for certain industries are reported for only the larger counties, has already been mentioned. There are other reporting difficulties. In Arkansas, for example, complete coverage is available only for the even years. In this case, adjustments had to be made to derive estimates for the odd years.

These disadvantages in employment security data, in some instances quite critical, are generally offset by their advantages. Therefore, this source is usually used to allocate the major portion of wages and salaries income, but adjustments are required in most instances to compensate for the data peculiarities in each state.

Census data: The other basic sources of data used to allocate wages and salaries are the Department of Commerce's various censuses, and County Business Patterns. Census data have one basic advantage; for specific years the coverage is complete and is generally assumed to be highly reliable. The obvious disadvantage in using this source is that the census data are available for only selected years. The Census of Population, for example, is available for 1950 and 1960; the Census of Business and Census of Manufacturers covers 1954 and 1958; and so on. Various interpolation and extrapolation techniques, or even simple arithmetic averaging, have been used to obtain allocations for the years not covered.

3. Wages and Salary Allocations by Major Industrial Sector

The sources used to allocate the subcomponents of wage and salary income are summarized in Table I.

The county distribution of hired farm labor, as reported in the Census of Agriculture, was used by most of the states to allocate farm wages and salaries. Generally, figures for 1949, 1954, and 1958 were used, with allocators for the intervening years obtained by interpolation and extrapolation. In some instances (Iowa and Nebraska) the average of the 1954 and 1958 figures was used to allocate the OBE state totals.

The government wages and salaries category of personal income was further broken into its subcomponents and each allocated separately. With few exceptions, federal civilian wages and salaries were allocated on the

basis of data presented in the Byrd Report.13/ Information provided by the Department of Defense was used to distribute federal military wages and salaries. The Census of Population was the source of data for the allocation of state and local government wages and salaries, but in this instance, state publications also provided a wealth of information.

The remaining components of wages and salaries were allocated largely on the basis of the county distribution of covered wages and salaries, as reported by the individual State Departments of Employment Security.

The other industries subcategory of wage and salary income typically accounts for a very small percentage of total wages and salaries. Consequently, it was allocated in most cases on the basis of information obtained from the other subcategories of wage and salary income or some other broad base, such as total covered wages and salaries.

B. Other Labor Income

1. Definition

The other labor income component of personal income is relatively small, accounting for only 3 or 4 per cent of total personal income. The major share of this fragmented category is "employer contributions to private pension and welfare funds." Other components are: compensation for injuries; pay for military reservists; director's fees; government payments to enemy prisoners of war ; federal contributions to group life insurance; merchant marine war-risk life and injury claims; compensation of prison inmates; marriage fees to justices of the peace; and jury and witness fees.

2. Alternative Allocators

In many county income studies, "other labor income" is included as part of "wages and salaries" since it is a minor category and there are few readily available series on which to base separate allocations. When other labor income is handled as a separate category, a broad, general allocator series (e.g., total population or total wages and salaries) is normally used.

13/ Report of the Joint Committee on Reduction of Non-Essential Federal
      Expenditures, 82nd Congress, 1st Session, On Federal Civilian Employ-
      ment 1950, U. S. Government Printing Office, Washington, D. C., 1950.

3. Procedures Used in This Study

Table II summarizes the data sources used to allocate other labor income. Most of the states allocated this income category on the basis of their county distribution of total wage and salary income. Two states deviated slightly from this approach.

For the state of Iowa, pay of military reservists was allocated separate in accordance with DOD information concerning the strength of reserve units located in that state. The remainder of other labor income was allocated to the counties according to the distribution of total wages and salaries.

For Arkansas, the allocation was made on the basis of the combined total of six subcategories of wage and salary income: (1) mining, (2) contract construction, (3) manufacturing, (4) finance, insurance, and real estate, (5) transportation, and (6) communications and public utilities. Wholesale and retail wages and salaries were omitted because of the prevalence of small businesses in this sector, few of which have organized pension plans.

C. Property Income

1. Definition

The property income component of personal income includes rent, dividends, and interest. The rental income subcomponent includes personal earnings from patents, copyrights; and rights to natural resources; as well as from rental of real property. Income from dividends and interest includes cash dividends, disbursements by profit-making corporations and total monetary and imputed interest payments. Imputed interest measures the value of services rendered to persons by banks and other financial institutions.

The Office of Business Economics provided estimates of these three categories along with the total property income estimates for each year 1950 through 1962 for each state.

2. Alternative Allocators

Property income is one of the major income categories for which there are no reliable direct allocators for distributing income among counties. Several alternative procedures can be used, but each has its advantages and limitations. As is the case with most of the other income categories, property income can best be handled by breaking it down into its component parts -- rental income, and dividends and interest.

- 20 -

Rental income: Possible indicators for use in allocating rental income include:

Assessed value of property: Property valuation data have the advantage of being available by county for each year. Notorious inequities in evaluation on the part of local authorities, however, could result in serious county-to-county discrepancies in the allocation of rental income. Therefore, adjustments should be made to compensate for variation in assessment ratios, as was done in the Kansas study.

Census of Housing data: The decennial Census of Housing provides data on numbers of dwelling units and median rent by county. These data are quite complete and uniform in coverage. However, they have the disadvantage of being available for only two years out of the 12 under study.

Other measures: Other indirect measures which have been used to allocate rental income include acres of land rented by farm operators (for the agriculture portion of rental income), retail sales, and bank deposits.

Dividends and interest: The task of finding suitable allocators for the dividends and interest subcategory of property income is even more difficult than for rental income. Some researchers treat dividends and interest separately. The following measures represent alternatives which have been used:

Bank deposits: Bank deposit data are available from the Federal Reserve System. In some instances, savings and loan deposits data can be combined with bank deposit data. There are certain dangers, however, associated with the use of these deposit data. The use of bank deposits will result in an overestimate of property income in those counties having banking centers, and conversely, those counties without banking centers will tend to be underestimated. The fact that deposit data usually include out-of-state, corporate, and government deposits also tends to limit the reliability of this measure unless these categories can be readily deleted. Nevertheless, the absence of other, more reliable measures may necessitate the use of deposit data.

Assessed value of property: Assessed value of property has been used to allocate dividends and interest. This measure has the same limitations as discussed previously.

Number of families with incomes over $10,000: These data, available in the decennial Census of Population, have been used as an allocator. One problem is their availability only every ten years.

Other measures: Other measures which have been used include
sales and use tax collections, deposit data compiled by tax assessors, and
proprietors' income. Often it is appropriate to use a combination of measures,
such as bank deposits, proprietors' income, and number of families with incomes
over $10,000, in the construction of reasonable allocators.

3. Procedures Used in This Study

Table III summarizes the data sources used for allocating property
income. Property evaluation data, with adjustments and modifications in some
instances, were used to allocate rental income for the majority of the states.
Bank deposits were the principal measure used to allocate income from divi-
dends and interest.

D. Proprietors' Income

1. Definition

Proprietors' income is divided into farm and nonfarm proprietors'
income. The nonfarm category includes net income of business proprietors and
professional practitioners. The business proprietors subcategory has the
following nine components: (1) agricultural services, forestry, and fisheries;
(2) mining; (3) construction; (4) manufacturing; (5) wholesale and retail
trade; (6) finance, insurance, and real estate; (7) transportation; (8) com-
munication and public utilities; and (9) services (excluding professional).
The professional practitioners subcategory includes doctors, lawyers, dentists,
etc.,who operate private practices, as opposed to being employed by others.

Farm proprietors' income equals gross farm income adjusted for
changes of inventory of certain crops and livestock minus expenses for opera-
ting the establishment. Gross farm income includes (1) sale of farm products;
(2) value of home consumption; (3) estimated rental value of farm dwellings;
and (4) government payments to farmers.

2. Alternative Allocators

Nonfarm proprietors' income: This category of proprietors' income
is similar to property income in that it is a category for which there are no
reliable direct allocators. Consequently, an indirect approach is required.
Several alternative indicators can be used.

Retail sales taxes: One technique is to use retail sales tax
receipts. The underlying assumption is that the location of business pro-
prietors and professional people is directly correlated with the location of

retail sales. One limitation to this approach is that receipts of the doctors and other professional people are generally not subject to the sales tax. A second limitation is that the place of residence is not necessarily in the same county as the business.

Number of proprietors, self-employed, and professional people: Another approach is to use data regarding the number of proprietors and/or self-employed persons which can be obtained from the Census of Population and Census of Business. Once these individuals have been located by county, each county's share of the state total is computed. These percentage figures are then used as the allocators for proprietors' income in the nonfarm category. A modification of this technique is to weight the employment data by the average wages in the appropriate retail, wholesale or service industry category. This refinement attempts to compensate for geographic variation in rates of return or earning levels. A related approach is to use wages and salaries in the trade, service, and wholesale industries as the allocator for business proprietors' income. In some cases, directories of professional people give information on the geographic dispersion of professional proprietors, and this information can be used to allocate their earnings.

State income taxes: Where available, data from state income tax returns can be used for allocating nonfarm proprietorship income. Here the problem is to identify those returns which can be traced to business proprietors and professional people. The use of state income tax information eliminates the situs problem.

Farm income: The farm proprietors' segment of personal income is particularly important in the six-state region covered by the study because of the dominant role of agriculture in the region's economy. In the rural counties of this region, farm income not only accounts for a large share of total personal income but also exerts a significant influence on the other sectors due to multiplier effects.

The most common technique for apportioning farm proprietors' income is to allocate both realized gross farm income and farm production expenses by county. Then, the latter is subtracted from the former to yield net farm income.

Most states collect annual production data relating to farm sales, expenses, etc., in conjunction with the numerous state and federal government farm programs. This backlog of data provides a wealth of information concerning specific crop and livestock operations at the county level. Thus, many states participating in this study were able to develop highly detailed estimates of farm proprietors' income.

Another approach is to rely on data (value of farm products sold) from the Census of Agriculture. This information has the limitation of being available only for selected years (1949, 1954, and 1959) during the study period. Consequently, estimates for years not covered by census data must be obtained by interpolation and extrapolation. In some cases, census data can be weighted or modified by use of state data.

3. Procedures Used in This Study

For each state, proprietors' income was broken down into two sub-categories--nonfarm and farm--and each allocated separately (See Table IV).

Nonfarm proprietors' income was allocated in a number of different ways. The Arkansas group relied on information from the Census of Population (1950 and 1960), and the Census of Business (1954). Self-employed workers per county in 1950 and 1960 plus the number of proprietors of unincorporated businesses in retail, wholesale and selected services trades as reported in the 1954 Census of Business served to provide benchmarks in the appropriate years. Then all other years during the study period were estimated by means of inter-polation and extrapolation.

The Iowa group constructed allocators for the two minor subcate-gories--professional services and business proprietors. Business proprietors' income was further broken down into nine industry subcategories: (1) agricul-tural services, forestry, and fisheries; (2) mining; (3) construction; (4) manufacturing; (5) wholesale and retail trade; (6) finance, insurance, and real estate; (7) transportation; (8) communication and public utilities; and (9) services (excluding professional). Each of these subcategories was allo-cated for 1949, 1954, and 1959 according to the same methodology used for wages and salaries in these categories. Allocations for the remaining years in the study period were made on the basis of the distribution obtained for the three calculated years (1949 for 1950 and 1951; 1954 for 1952 through 1956, etc.). Proprietors' income originating in the professional services category was allocated to the counties on the basis of data from the professional ser-vice directories for Iowa.

Sales tax receipts by county were used to allocate proprietors' in-come in Kansas and Missouri. The central assumption was that the location of proprietors and professional people is correlated with the location of retail sales.

The Nebraska group relied on data from the 1948, 1954, and 1958 Census of Business. The number of proprietors in retail trade, wholesale trade and services was weighted by the annual average wage in each respective activity.

State income tax information was utilized in Oklahoma. Ten tax groups (professional persons, services, food, contracting, etc.) were added together in each county for each year. Each county's relationship to the state total was calculated and used as the allocator.

The general approach to estimating farm proprietors' income was to subtract estimated farm expenses by county from estimated gross farm income (adjusted for inventory) which yields net farm income by county. Both the expense items and the income items are specified in considerable detail. In Iowa, for example, 17 separate income categories, and seven major expense categories were evaluated. Basic data sources included the Census of Agriculture, the Census of Population, the USDA Farm Income Situation Reports, as well as reports issued by various state agencies.

Farm proprietors' income in Kansas was apportioned to the counties in two basic steps. First, an estimate of net income from farming was obtained. Second, government payments were added to obtain total farm proprietors' income. Net income from farming was based on expense, receipts, and inventory data obtained from the Kansas State Department of Agriculture Farm Facts. These annual data, which are presented on a value-added basis, were adjusted to a proprietors' net income basis by applying Census of Agriculture relationships. Annual USDA tabulations of government payments to Kansas farmers were used to allocate the government payments component of farm proprietors' income.

Missouri's income estimates were provided by the University of Missouri Department of Agricultural Economics. Annual allocators were developed from two base years--1949 and 1959.

Data from the 1949, 1954, and 1959 Census of Agriculture were used in Oklahoma. Value of farm products sold was used as the allocator. Interpolation and extrapolation were used to derive estimates for the other years (see the Oklahoma Appendix Volume for a description of alternative techniques examined by the project staff).

E. Transfer Payments

1. Definition

Transfer Payments, "consists of monetary income receipts of individuals from government and business (other than government interest) for which no services are rendered currently, of government payments and corporate gifts

to nonprofit institutions, and of individuals' bad debts to business."[14] Thus, it is that component of personal income which does not accrue to persons from current production. Transfer payments include:

Federal transfer payments: (1) old age and survivors' insurance benefits, (2) state and national unemployment insurance benefits, (3) railroad benefits (unemployment and retirement), (4) federal civilian pensions, (5) government life insurance benefits, (6) payments to nonprofit institutions, (7) military retirement, (8) veterans' pensions and compensation, and (9) other.

State and local government transfer payments: (1) government pensions, (2) direct relief, and (3) other.

Business transfer payments: This subcategory consists mainly of consumer bad debts. Also included are gifts to nonprofit institutions and theft of merchandise by individuals.

2. Procedures Used in This Study

Because of the diversity within the transfer payment category, it is usually broken down into subcomponents which are then allocated separately. Table V summarizes the basic data sources used for each of the states. The following is a brief description of the allocators used to distribute each of the categories of transfer payments to the counties.

Federal transfer payments: Social Security payments make up the largest portion of federal transfer payments. Therefore, the series used to allocate old age and survivors insurance benefits might also be used to allocate the entire federal transfer payments category without biasing the results significantly. In this study, however, federal transfer payments were further disaggregated into individual subcomponents, and each was allocated separately as follows:

Old age and survivors insurance benefits: OASI benefits were distributed by each state in accordance with Social Security payments by county. The data necessary for this allocation were made available by the Social Security Administration.

State and national unemployment insurance benefits: UI benefits were distributed to the county level in accordance with the number of

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14/ U. S. Department of Commerce, Office of Business Economics, National Income, 1954 Edition, Supplement to the Survey of Current Business, U. S. Government Printing Office, Washington: 1954, p. 60.

unemployed or unemployment payments. Nebraska weighted the number unemployed by median income, and Missouri based the allocation on the distribution of total population.

Railroad benefits: Railroad benefits were allocated on the basis of railroad wages and salaries or railroad employment. Nebraska weighted employment by median income. Missouri used the number employed in public utilities as reported in County Business Patterns. Arkansas combined railroad benefits with several other subcomponents in a miscellaneous category and allocated it according to number of white males over 65.

Federal civilian pensions: Income from federal civilian pensions was distributed to the counties on the basis of federal civilian government wages and salaries or federal civilian employment as reported in a variety of sources. Arkansas included federal civilian pensions in its miscellaneous category, allocated according to the number of white males over 65. Missouri based its allocation on the population distribution by county.

Government life insurance benefits: Income from this source was generally allocated by the number of veterans per county. Nebraska used the county distribution of population, while Kansas used number of males per county over 14 years of age. Iowa used the number of persons in age group 15 to 24 as reported in the 1940 Census of Population.

Payments to nonprofit institutions: Payments to nonprofit institutions were distributed to the county level by using a variety of different indicators including the number of students enrolled in institutions of higher learning; the county distribution of Old Age and Survivors Insurance Benefits; wages and salaries paid for private educational services; or a combination of several payments series.

Military retirement: Military retirement income was allocated according to the number of veterans per county, or a more general series based on the county distribution of population.

Veterans' pensions and compensation: Veterans' pensions were distributed according to the number of veterans per county, or by some appropriate segment of the population.

Other federal transfer payments: This miscellaneous category was generally apportioned to the counties in accordance with the distribution of all other federal transfer payments or Social Security payments. Iowa and Missouri based the allocation on population, while Arkansas used the number of white males over 65.

State and local government transfer payments: As was the case with federal transfer payments, state and local government transfer payments were divided into subcomponents which were allocated separately as follows:

Government pensions: Income from Government pensions was usually apportioned on the basis of state and local government wages and salaries or state and local government employment. Arkansas based the allocation on the number of white males over 65. Nebraska used a general transfer payment allocator based on the county distribution of other combined transfer payments.

Direct relief: Relief payments were allocated in all states on the basis of payment records.

Other state and local government transfer payments: This miscellaneous category generally was combined with direct relief payments, or was allocated according to the distribution of other transfer payments. Arkansas again used the number of white males over 65. Iowa based allocation on number of dependent children per county, and Missouri used total population.

Business transfer payments: This final category was generally distributed to the counties according to sales tax receipts. Iowa used nonfarm proprietors' income, and Nebraska used a general series based on the distribution of other separately allocated transfer payments categories.

A more detailed discussion of the procedures used by the respective states is presented in the Appendix volume for each state.

F. Personal Contributions for Social Insurance

This category includes all payments from personal income to social security insurance programs. The total payment is made up of:

(1) Old-age and survivors' insurance;
(2) State unemployment insurance;
(3) Cash sickness--compensation funds;
(4) Railroad retirement;
(5) Federal civil retirement systems;
(6) State and local retirement systems; and
(7) Government life insurance.

This final component of personal income is an exclusion rather than an addition. Since these payments to the various social insurance programs are included in the Wages and Salaries, and Proprietors' Income series, they must be deducted in order to derive pretax personal income available to individuals and/or proprietors.

The data series used to allocate personal contributions to social insurance are shown in Table VI.

APPENDIX

TABLES - I - VI

TABLE I

SOURCES USED FOR ALLOCATING WAGES AND SALARIES

Income Categories	Arkansas	Iowa	Kansas	Missouri	Nebraska	Oklahoma
Wages & Salaries Farm	Census of Agriculture	Census of Agriculture	Census of Agriculture	Census of Agriculture	Census of Agriculture	Census of Agriculture
Mining	Employment Security	Census of Population (weighted by wage data from Census of Mineral Industries)	Employment Security	Employment Security	Census of Pop. (weighted by avg. wages from Census of Business)	Employment Security (supplemented by County Bus. Patterns)
Contract Construction	Employment Security	Employment Security & Census of Population	Employment Security	Employment Security	Census of Pop. (weighted by avg. wages from Census of Bus.)	Employment Security & County Bus. Patterns
Manufacturing	Employment Security	Employment Security & Census of Manufacturers	Employment Security	Employment Security	Employment Security & Census of Manufacturers (weighted by avg. wages from Census of Bus.)	Employment Security & County Bus. Patterns
Retail & Wholesale Trade	Employment Security	Census of Bus. & County Bus. Patterns	Employment Security	Employment Security	Employment Security, Cen. of Manufacturers & Cen. of Business	Employment Security & County Bus. Patterns

TABLE I (Continued)

Income Categories	Arkansas	Iowa	Kansas	Missouri	Nebraska	Oklahoma
Transportation	Employment Security	Census of Population	Employment Security & Census of Population	Employment Security	Census of Population (weighted by avg. wages from Census of Business)	Employment Security & County Bus. Patterns
Finance, Insurance, & Real Estate	Employment Security	Employment Security & County Bus. Patterns	Employment Security	Employment Security	Employment Security (weighted by avg. wages from Census of Business)	Employment Security & County Bus. Patterns
Communications & Public Utilities	Employment Security	Census of Population	Employment Security		Census of Population (weighted by avg. wages from Census of Business)	Employment Security & County Bus. Patterns
Services	Employment Security	Census of Business & Census of Population	Employment Security	Employment Security	Employment Security & Census of Business	Employment Security & County Bus. Patterns
Government Federal Military	Census of Population (supplemented by Dept. of Defense data)	Dept. of Defense	Census of Population	Census of Population	Census of Population	Dept. of Defense

TABLE I (Concluded)

Income Categories	Arkansas	Iowa	Kansas	Missouri	Nebraska	Oklahoma
Federal Civilian	Byrd Report	Byrd Report	Byrd Report	Census of Population	Byrd Report (weighted by avg. wages from Census of Business)	?
State & Local	Census of Population	Various State Sources	Various State Sources & Census of Govts.	Census of Population	Census of Population	Various State Sources
Other Industries	Census of Population	Census of Population	Employment Security	Employment Security	Employment Security & Census of Population (weighted by avg. wage from Census of Business)	Employment Security

TABLE II

SOURCES USED FOR ALLOCATING OTHER LABOR INCOME

Income Categories	Arkansas	Iowa	Kansas	Missouri	Nebraska	Oklahoma
Other Labor Income	County Distribution of Selected Subcategories of Wage & Salary Income	County Distribution of Total Wage & Salary Income & Dept. of Defense Data	County Distribution of Total Wage & Salary Income	County Distribution of Total Wage & Salary Income	County Distribution of Total Wage & Salary Income	County Distribution of Total Wage & Salary Income

TABLE III

SOURCES USED FOR ALLOCATING PROPERTY INCOME

Income Categories	Arkansas	Iowa	Kansas	Missouri	Nebraska	Oklahoma
Property Income Rental Income	Census of Housing	Census of Housing & Census of Agriculture	Assessed Value of Real Property (Adjust.)	Assessed Value of Real Property	Assessed Value of Intangible Property	Bank Deposits
Dividends & Interest Dividends	Bank Deposits & Wages & Salaries & Proprietors' Income	Census of Population (No. families with over $10,000 income)	Bank Deposits	Bank Deposits (Adjust.)	Assessed Value of Intangible Property	Bank Deposits
Interest	Bank Deposits & Wages & Salaries & Proprietors' Income	Bank Deposits & Savings & Loan Deposits	Bank Deposits	Bank Deposits (Adjust.)	Assessed Value of Intangible Property	Bank Deposits

TABLE IV

SOURCES USED FOR ALLOCATING PROPRIETORS' INCOME

Income Categories	Arkansas	Iowa	Kansas	Missouri	Nebraska	Oklahoma
Proprietors' Income						
Nonfarm Proprietors						
Business	Census of Population & Census of Business	Employment Security, Census of Population, Census of Business, Census of Manufacturers, & County Business Patterns	Sales Tax Receipts	Sales Tax Receipts	Census of Business	State Income Tax Data
Professional	Census of Population & Census of Business	Various State Sources	Sales Tax Receipts	Sales Tax Receipts	Census of Business	State Income Tax Data
Farm Proprietors	Census of Agriculture, Census of Population, & Various USDA Sources	Census of Agriculture, Census of Population, & Various USDA Sources	Census of Agriculture & Various USDA & State Sources	State Sources	Census of Agriculture, Census of Population, & Various USDA Sources	Census Agriculture, Census of Population, & Various USDA Sources

TABLE V

SOURCES USED FOR ALLOCATING TRANSFER PAYMENTS

Income Categories	Arkansas	Iowa	Kansas	Missouri	Nebraska	Oklahoma
Transfer Payments						
Federal Transfer Payments						
Old Age and Survivors Insurance Benefits	Social Security Data	Social Security Data	Social Security Data	Social Security Data	Social Security Data	Social Security Data
State and National Unemployment Insurance Benefits	Employment Security & Census of Population	Employment Security	Employment Security & Census of Population	Census of Population	Census of Population	State Sources
Railroad Benefits	Census of Population	Census of Population	Railroad Wages & Salaries	County Business Patterns	Census of Population (weighted by median income)	Census of Population
Federal Civilian Pensions	Census of Population	Census of Population	Federal Civilian Government Wages & Salaries	Census of Population	Based on a Combination of other Transfer Payments	Byrd Report

TABLE V (Continued)

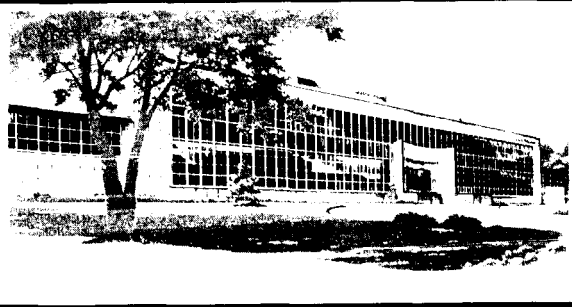| Income Categories	Arkansas	Iowa	Kansas	Missouri	Nebraska	Oklahoma
Government Life Insurance Benefits	Veterans Administration Data & Census of Population	Census of Population	Census of Population	Census of Population	Based on Combination of other Transfer Payments	Veterans Administration Data
Payments to Non-profit Institutions	Census of Population	Census of Population	State Sources	State Sales Tax Data	Based on Combination of other Transfer Payments	Social Security Data
Military Retirement	Veterans Administration Data & Census of Population	Census of Population	Census of Population	Census of Population	Based on Combination of other Transfer Payments	Veterans Administration Data
Veterans Pensions	Veterans Administration Data & Census of Population	Census of Population	Census of Population	Census of Population	Census of Population	Veterans Administration Data
Other Federal Transfer Payments	Census of Population	Census of. Population	Total Federal Transfer Payments	Census of Population	Based on Combination of other Federal Transfer Payments	Social Security Data

TABLE V (Concluded)

Income Categories	Arkansas	Iowa	Kansas	Missouri	Nebraska	Oklahoma
State and Local Transfer Payments						
Government Pensions	Census of Population	State and Local Government Wages & Salaries	State and Local Government Wages & Salaries	State Division of Welfare	State Dept. of Public Welfare	Census of Population
Direct Relief	State Dept. of Public Welfare	State Dept. of Social Welfare	State Dept. of Social Welfare	State Division of Welfare	State Dept. of Public Welfare	State Dept. of Public Welfare
Other State and Local Transfer Payments	Census of Population	State Dept. of Social Welfare	State Dept. of Social Welfare	State Division of Welfare	State Dept. of Public Welfare	State Dept. of Public Welfare
Business Transfer Payments	Retail Sales Tax Data	Nonfarm Proprietors' Income	Sales Tax Data	Sales Tax Data	Based on Combination of other Transfer Payments	Sales Tax Data

TABLE VI

DATA SERIES USED FOR ALLOCATING PERSONAL CONTRIBUTIONS TO SOCIAL INSURANCE

Income Categories	Arkansas	Iowa	Kansas	Missouri	Nebraska	Oklahoma
Personal Contributions for Social Insurance	Combined Wages & Salaries & Proprie- tors' In- come	Wages & Salaries	Wages & Salaries & Proprie- tors' In- come	Population	Other Labor Income	--

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